

Remarks

I. Status of claims

Claims 1-12 and 21-23 were pending.

Independent claim 1 has been amended to incorporate the features of claim 21. Since claim 21 was presented in the Amendment of November 24, 2004, no new issues are raised by the current amendment of claim 1.

Claims 4, 19, 22, and 23 have been rewritten in independent form in response to the Examiner's indication that such claims would be allowed.

Claim 21 has been canceled without prejudice.

II. Claim rejections

The Examiner has rejected claims 1, 5-8, 10, and 11 under 35 U.S.C. § 102(b) over Uchiya (U.S. 5,258,608).

The Examiner has rejected claims 1-3, 5-8, and 10-12 under 35 U.S.C. § 103(a) over Uchiya.

The Examiner has rejected claims 1, 5, 7, 8, 10-12, and 21 under 35 U.S.C. § 102(b) over Lin (U.S. 6,242,730).

A. Independent claim 1

Independent claim 1 has been amended to incorporate the features of claim 21, which was presented previously in the amendment dated November 24, 2004. In particular, independent claim 1 now recites that

the active image sensing device structure comprises an array of light sensing elements,

forming the color filter array comprises forming an array of color filters each disposed over a respective light sensing element such that light travels from each color filter to a respective light sensing element through a respective light

transmission path substantially transmissive to radiation in a visible wavelength range,
forming the bottom antireflection coating comprises forming the bottom antireflection coating with a thickness less than approximately 200 nm, and
after the removing, remaining portions of the antireflection coating are disposed in each light transmission path between the color filter array and the active image sensing device structure.

In the Office action dated April 12, 2005, the Examiner did not reject claim 21 under 35 U.S.C. § 102(b) over Uchiya. Since independent claim 1 now incorporates dependent claim 21 in its entirety, the Examiner's rejection of independent claim 1 under 35 U.S.C. § 102(b) over Uchiya should be withdrawn.

For the record, in Uchiya's imaging device, the aluminum layers 4 are not substantially transmissive to radiation in a visible wavelength range (see, e.g., col. 4, lines 11-15, and FIG. 4). Accordingly, in Uchiya's imaging device, the only light transmission paths that are located between the color filters 11, 15, 19 and the optoelectrical conversion regions 2 and that are substantially transmissive to radiation in a visible wavelength range, are the light transmission paths defined between adjacent aluminum layers 4. Since, the antireflection layers 5, 6 in Uchiya's imaging device exist only on top of the aluminum layers 4, these antireflection layers 5, 6 are *not* "disposed in each light transmission path between the color filter array and the active image sensing device structure," as now recited in claim 1.

In the Office action dated April 12, 2005, the Examiner rejected claims 1 and 21 under 35 U.S.C. § 102(b) over Lin (U.S. 6,242,730). As amended, claim 1 now recites that "forming the bottom antireflection coating comprises forming the bottom antireflection coating with a thickness less than approximately 200 nm." The Examiner has asserted that Lin's spin-on-glass (SOG) layer 306 constitutes an antireflection coating. Lin, however, teaches that "[i]n order to obtain a desired thickness and uniformity of the [SOG] 306, it is necessary to spin coat SOG 306 to a thickness of 2000 angstroms, twice" (col. 3, lines 50-52). That is, Lin clearly teaches that the SOG layer 306 must have a thickness of 400 nm.

For at least these reasons, the Examiner's rejection of independent claim 1 under 35 U.S.C. § 102(b) over Lin now should be withdrawn.

B. Claims 2, 3, 5-8, and 10-12

Each of claims 2, 3, 5-8, and 10-12 incorporates the features of independent claim 1 and therefore is patentable over Uchiya and Lin for at least the same reasons explained above.

The Examiner has rejected claims 5 and 11 under 35 U.S.C. § 103(a) over Uchiya. In addition to the reasons explained above in connection with independent claim 1, claims 5 and 11 are patentable over Uchiya for the following additional reasons.

For the purpose of the following discussion, the examiner is reminded that:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not on applicants' disclosure.

MPEP § 706.02(j) (emphasis added). Furthermore, as pointed out by the Patent Office Board of Appeals and Interferences:

The examiner should be aware that "deeming" does not discharge him from the burden of providing the requisite factual basis and establishing the requisite motivation to support a conclusion of obviousness.

Ex parte Stern, 13 USPQ2d 1379 (BPAI 1989).

1. Dependent claim 5

Claim 5 recites that "the bottom antireflection coating is substantially transmissive to radiation in a wavelength range of about 400 nm to about 700 nm."

In the Office action dated April 12, 2005, the Examiner has rejected claim 5 under 345 U.S.C. § 103(a) over Uchiya for the reasons set forth in the first Office action dated August 31, 2004. In the first Office action, however, the Examiner did not provide any explanation for his rejection of claim 5.

Uchiya teaches that the “layers 5 and 6 combine to act as an anti-reflection layer by causing destructive interference of light to occur in the 436-nm wavelength region between rays reflecting off the aluminum layer 4 and those reflecting off the layers 5 and 6 due to the ratio of the 1000-Å thickness of the underlying layer 5 to the 300- Å thickness of the overlying layer 6” (col. 3, lines21-27).

The Examiner has not shown where the motivation to modify Uchiya's imaging device to include a bottom antireflection coating that is substantially transmissive to radiation in a wavelength range of about 400 nm to about 700 nm is taught or suggested in the prior art. Therefore, the Examiner has not provided the requisite factual basis and has not established the requisite motivation to support his deemed conclusion that the features recited in claim 5 would have been obvious to one of ordinary skill in the art at the time the invention was made (see MPEP § 706.02(j)).

2. Dependent claim 11

Claim 11 recites that “the bottom antireflection coating forms a protective barrier over metal structures at the exposed surface of the active image sensing device structure during formation of the color filter array.”

In the Office action dated April 12, 2005, the Examiner has rejected claim 11 under 345 U.S.C. § 103(a) over Uchiya for the reasons set forth in the first Office action dated August 31, 2004. In the first Office action, however, the Examiner did not provide any explanation for his rejection of claim 11.

Uchiya does not teach or suggest that the antireflection layers 5, 6 form a protective barrier over metal structures at the exposed surface of the active image sensing device structure during formation of the color filter array. Indeed, in accordance with Uchiya's approach, the antireflection layers 5, 6 are covered by the anti-blending layer 10 or the resinous filling layer 30 before the color filter array is formed. Therefore, the antireflection layers 5, 6 do not appear to perform any type of protective barrier function during the formation of the color filter array.

The Examiner has not shown where the motivation to modify Uchiya's imaging device such that the antireflection layers 5, 6 form a protective barrier over metal structures at the exposed surface of the active image sensing device structure during formation of the color

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filter array is taught or suggested in the prior art. Therefore, the Examiner has not provided the requisite factual basis and has not established the requisite motivation to support his deemed conclusion that the features recited in claim 11 would have been obvious to one of ordinary skill in the art at the time the invention was made (see MPEP § 706.02(j)).

III. Conclusion

For the reasons explained above, all of the pending claims are now in condition for allowance and should be allowed.

Charge any excess fees or apply any credits to Deposit Account No. 50-1078.

Respectfully submitted,

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